

Claims

- [c1] What is claimed is:
1. An optical data storage medium comprising:
 - a first substrate, and a surface of the first substrate including a plurality of first data structures;
 - a second substrate positioned on the first substrate, and a surface of the second substrate including a plurality of second data structures positioned on the first data structures;
 - a reflective layer positioned on the surface of the second substrate; and
 - a masking layer interposed between the reflective layer and the first substrate for covering the first data structures, and the masking layer having a changeable reflectivity for limiting the second data structures to be read.
 - [c2] 2. The optical data storage medium of claim 1 wherein the reflective layer is a metallic layer.
 - [c3] 3. The optical data storage medium of claim 1 wherein the masking layer is composed of a phase change material, and the phase change material transforms from an amorphous phase into a crystal phase by using accumulated energy during reading processes of the optical data storage medium.
 - [c4] 4. The optical data storage medium of claim 3 wherein the changeable reflectivity increases with the ratio of crystal structures within the masking layer raises until the first data structures are readable by a laser beam.
 - [c5] 5. The optical data storage medium of claim 1 is read by a laser beam emitted from a picked head installed under the first substrate.
 - [c6] 6. The optical data storage medium of claim 1 wherein the first data structures are used to store a warning statement showing that the second data structures are unreadable.
 - [c7] 7. The optical data storage medium of claim 1 wherein the second data structures is formed by etching the surface of the second substrate counterclockwise.

- [c8] 8. An optical data storage medium comprising:
at least a substrate, a surface of the substrate including a plurality of data structures;
at least a reflective layer positioned on a surface of the substrate; and
at least a reactive layer positioned on the surface of the substrate;
wherein the reactive layer comprising at least one kind of reactive compound,
and the reactive layer using accumulated energy during reading processes of the optical data storage medium to diffuse the reactive compound to the reflective layer for changing reflectivity of the reflective layer and limiting the data structures to be read.
- [c9] 9. The optical data storage medium of claim 9 further comprises a barrier layer interposed between the reflective layer and the reactive layer for controlling a diffusion time of the reactive compound diffusing from the reactive layer to the reflective layer.
- [c10] 10. The optical data storage medium of claim 8 wherein the reactive layer is interposed between the reflective layer and the substrate.
- [c11] 11. The optical data storage medium of claim 8 wherein the reactive layer is interposed between the reflective layer and a picked head.
- [c12] 12. The optical data storage medium of claim 8 further comprises a detection device installed in a lead-in area of the optical data storage medium for computing read times of the optical data storage medium.
- [c13] 13. An optical data storage medium comprising:
at least a substrate, a surface of the substrate including a plurality of data structures;
at least a reflective layer positioned on a surface of the substrate; and
a masking layer positioned on a surface of the reflective layer; and
at least a reactive layer positioned on the surface of the substrate;
wherein the reactive layer comprising at least one kind of reactive compound,
and the reactive layer using accumulated energy during reading processes of the optical data storage medium to diffuse the reactive compound to the

masking layer for changing reflectivity of the masking layer and limiting the data structures to be read.

- [c14] 14. An optical data storage medium of claim 13 further comprises a barrier layer interposed between the reactive layer and the masking layer for controlling a diffusion time of the reactive compound diffusing from the reactive layer to the masking layer.
- [c15] 15. The optical data storage medium of claim 13 wherein the masking layer is interposed between the reflective layer and a pickup head.
- [c16] 16. The optical data storage medium of claim 13 further comprises a detection device installed in a lead-in area of the optical data storage medium for computing read times of the optical data storage medium.